3. Research Gap, Questions and Hypotheses:

3.1. Research Gap:

Review of existent literature on Intellectual Capital and Firm Performance reveals the following research void:

- Review of extent literature on Intellectual Capital and organizational performance reveals that mixed results have been reported by scholars (see Table–A3). Some studies have found positive relationship between IC and organizational performance (for e.g. Clarke et al., 2011; Gan and Saleh, 2008; Mehralian et al., 2012; Young et al., 2009). Yet others have reported negative or weak relationship between the two variables (Abdulsalam et al., 2011; Gruian, 2011; Firer and Williams, 2003; Zéghal and Maaloul, 2010).

- The research studies interlinking VAICTM and performance of Indian firms have been compiled in Table–A2. In conformation to the global results, studies in India have also reported mixed findings.

- The phenomenon of inconclusive result has been reported not only at the aggregate level of IC of a firm but also at the component level i.e. for Human Capital and Structural Capital. Same is true for Physical Capital (measured by Capital Employed) as well.

- By and large, the researchers have used the VAICTM model in its original form. Only a handful of studies have attempted to expand the model by adding variables such as Research and Development (R&D) Expenditure, Advertising Expenditure and Intellectual Property Rights (Chang, 2010; Chang and Hsieh, 2011; Chen et al., 2005; Phusavat et al., 2011). However, barring Chen et al.
(2005), other studies do not measure Relational Capital. Even Chen et al. (2005) do not attempt to modify the VAICTM model. Rather, they incorporate Relational Capital as an additional indicator along with the existing variables of VAICTM, without disturbing the basic scheme of the model. Hence, issues pertaining to perfect superimposition and interdependency between Human Capital and Structural Capital have remained unaddressed.

3.2. Research Questions:-

Based on the research gap identified in the studies conducted on Intellectual Capital and Firm Performance, the following research questions have been taken up:-

1) How does the efficiency of Intellectual Capital and Physical Capital impact performance of firms in India?

2) How does the efficiency of the components of Intellectual Capital impact the performance of firms in India?

3) How is the predictability of the modified and extended Value Added Intellectual Coefficient (E-VAIC) model better than the original VAICTM model?

3.3. Research Hypotheses:-

For addressing the three research questions, a set of testable hypotheses have been proposed. The first research question is concerned with the efficiencies of Intellectual and Physical Capital and their effect on performance of firms which happens to be the dependent variable in this research study. Here performance refers to financial performance of companies. In order to measure dependent variable, three performance
indicators have been selected – Return on Assets (ROA); Return on Equity (ROE) and Return on Sales (ROS). To study the effect of Intellectual Capital efficiency, three hypotheses have been proposed:

**H1a:** Intellectual Capital efficiency of a firm is positively related to its performance (ROA).

**H1b:** Intellectual Capital efficiency of a firm is positively related to its performance (ROE).

**H1c:** Intellectual Capital efficiency of a firm is positively related to its performance (ROS).

The first research question mentions about the efficiency of Physical Capital as well. To address this, following hypotheses have been proposed:

**H2a:** Physical Capital efficiency of a firm is positively related to its performance (ROA).

**H2b:** Physical Capital efficiency of a firm is positively related to its performance (ROE).

**H2c:** Physical Capital efficiency of a firm is positively related to its performance (ROS).

The second research question is concerned with the efficiency of Intellectual Capital components and its impact on performance of firms. Consequently, for interlinking three Intellectual Capital components (HC, SC and RC) and three measures of firm performance (ROA, ROE and ROS), following hypotheses have been developed:-
**H3:** Human Capital efficiency of a firm is positively related to its performance (ROA).

**H4:** Human Capital efficiency of a firm is positively related to its performance (ROE).

**H5:** Human Capital efficiency of a firm is positively related to its performance (ROS).

**H6:** Structural Capital efficiency of a firm is positively related to its performance (ROA).

**H7:** Structural Capital efficiency of a firm is positively related to its performance (ROE).

**H8:** Structural Capital efficiency of a firm is positively related to its performance (ROS).

**H9:** Relational Capital efficiency of a firm is positively related to its performance (ROA).

**H10:** Relational Capital efficiency of a firm is positively related to its performance (ROE).

**H11:** Relational Capital efficiency of a firm is positively related to its performance (ROS).

The third research question is related with a comparative study between Pulic’s VAICTM model and the E-VAIC model proposed in this thesis. Addition of variables to VAICTM model improves its explanatory power (Chang, 2010; Chang & Hsieh, 2011; Chen et al., 2005; Clarke et al., 2011). In order to test the efficiency of the
modified model, it is intended to compare the results of the same with that of VAICTM. The assumption is: “In comparison to VAICTM model, the modified and extended VAICTM model (E-VAIC) proposed in this study is a better predictor of the relationship between Intellectual Capital and performance of firm”. Since three performance variables have been selected as dependent variables, the corresponding hypotheses shall be:-

**H12a:** *In comparison to VAICTM model, the E-VAIC model is a better predictor of relationship between Intellectual Capital and performance (ROA) of a firm.*

**H12b:** *In comparison to VAICTM model, the E-VAIC model is a better predictor of relationship between Intellectual Capital and performance (ROE) of a firm.*

**H12c:** *In comparison to VAICTM model, the E-VAIC model is a better predictor of relationship between Intellectual Capital and performance (ROS) of a firm.*

In this dissertation, these hypotheses have been independently applied on the Pharmaceutical, Information & Technology (Software Firms) and Healthcare firms of India.